

RESEARCH PAPER

Prevalence of smoking among major movie characters: 1996–2004

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Background: Reports of a relationship between watching smoking in movies and smoking among adolescents have prompted greater scrutiny of smoking in movies by the public health community.

Objective: To assess the smoking prevalence among adult and adolescent movie characters, examine trends in smoking in movies over time, and compare the data with actual smoking prevalence among US adults and adolescents.

Design and methods: Smoking status of all major human adolescent and adult movie characters in the top 100 box office hits from 1996 to 2004 (900 movies) was assessed, and smoking prevalence was examined by Motion Picture Association of America (MPAA) rating and year of release.

Results: The movies contained 5944 major characters, of whom 4911 were adults and 466 were adolescents. Among adult movie characters, the overall smoking prevalence was 20.6%; smoking was more common in men than in women (22.6% v 16.1%, respectively, $p < 0.001$), and was related to MPAA rating category (26.9% for movies rated R (restricted, people aged < 17 years require accompanying adult), 17.9% for PG-13 (parents strongly cautioned that some material might be inappropriate for children) and 10.4% for G/PG (general audiences, all ages; parental guidance suggested for children), $p < 0.001$). In 1996, the smoking prevalence for major adult movie characters (25.7%) was similar to that in the actual US population (24.7%). Smoking prevalence among adult movie characters declined to 18.4% in 2004 (p for trend < 0.001), slightly below that for the US population for that year (20.9%). Examination of trends by MPAA rating showed that the downward trend in smoking among adult movie characters was statistically significant in movies rated G/PG and R, but not in those rated PG-13. A downward trend over time was also found for smoking among adolescent movie characters. There was no smoking among adult characters in 43.3% of the movies; however, in 39% of the movies, smoking prevalence among adult characters was higher than that in the US adult population in the year of release. **Conclusions:** Smoking prevalence among major adolescent and adult movie characters is declining, with the downward trend among adult characters weakest for PG-13-rated movies. Although many movies depict no adult smoking, more than one third depict smoking as more prevalent than that among US adults at the time of release.

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Recent research has established that there is an association between watching smoking in movies and smoking among adolescents.^{1–7} This has prompted greater scrutiny of the movie industry by the public health community,⁸ and has highlighted the need to understand better how and why smoking is depicted in movies. As smoking among movie characters considerably influences smoking among youths, the public health community needs data on its frequency and reach. Just as quantitative measures of smoking among the general population are used to assess the effectiveness of public health campaigns on smoking, quantitative measures could be used to assess the success of public health campaigns aimed at reducing depictions of smoking in movies. Smoking in movies is generally quantified through content analysis, in which a specified sample frame of movies is assessed according to a set of predefined criteria. Previous studies generally agree that (1) smoking is depicted in most movies^{9–15}; (2) smoking in movies increases as Motion Picture Association of America rating increases from G to R^{9 14 15}; (3) movie characters who smoke do not represent the typical smoker (in that they are more likely to be affluent, good looking and powerful than are typical smokers)^{9 12}; and (4) smoking in movies is rarely depicted in the context of negative health outcomes.^{9 10 12 15}

Content analyses vary in the way they quantify movie smoking, and this makes it difficult to compare results across

studies. One objective measure of smoking in movies is the smoking prevalence among major characters. This type of assessment requires coders to determine the number of major characters (however this is defined) and also to determine whether or not each character is depicted as a smoker. The overall smoking prevalence among characters and yearly time trends can then be determined, as can prevalence rates by movie and character traits (eg, sex or age). Although the smoking prevalence among characters has not been measured in all content analyses, it is reported in many of them, and is remarkably consistent. McIntosh *et al*¹³ reported a smoking rate of 21% among characters in films released in the 1980s. Dalton *et al*⁹ and Omidvari *et al*¹⁶ reported rates of 25% and 21%, respectively, for movies released in the 1990s. We report time trends for smoking prevalence among adult and adolescent movie characters for the top 100 US box office hits released over a 9-year period to better understand recent trends in smoking among movie characters.

METHODS

This report is a continuation of a content analysis for which the methods and reliability have been published previously.⁹ Since 1996, the top 100 box office hits for each year

Abbreviations: MPAA, Motion Picture Association of America; MTFS, Monitoring the Future Survey

Table 1 Smoking prevalence among major movie characters by character type and movie rating

Character type	G/PG		PG-13		R		Total	
	n	Smokers, n (%)	n	Smokers, n (%)	n	Smokers, n (%)	n	Smokers, n (%)
Adolescent human	167	2 (1.2)	146	16 (11.0)	153	28 (18.3)	466	46 (9.9)
Adult human	711	74 (10.4)	2108	378 (17.9)	2092	562 (26.9)	4911	1014 (20.6)
Other	343	9 (2.6)	145	16 (11.0)	79	6 (7.6)	567	31 (5.5)
Total	1221	85 (7.0)	2399	410 (17.1)	2324	596 (25.6)	5944	1091 (18.4)

G, general audiences, all ages; PG, parental guidance suggested for children; PG-13, parents strongly cautioned that some material might be inappropriate for children; R, restricted, people aged <17 years require accompanying adult.

(determined on 1 March the next year and obtained from <http://www.worldwideboxoffice.com>) have been content coded for tobacco use. This report covers 900 movies released over the 9-year period from 1996 to 2004. We used the top 100 movies to capture those likely to be seen by a substantial proportion of US adolescents. For each movie, coders generated a list of major characters, defined as those who played a major part in the film and who were essential to the development of the plot. Major characters generally included all characters billed with the movie or listed on the DVD case, along with others deemed essential to the plot. For major characters, we coded sex, race and socio-economic status, and whether the star's name appeared on the front cover of the video box. We also coded whether each character engaged in tobacco use. Tobacco use in the content coding scheme included use of spit tobacco. For this analysis, we deleted characters depicted as spit tobacco users ($n=18$) from the numerator of our prevalence determination.

Reliability

Two trained coders conducted the content analyses. To evaluate inter-rater reliability, 10% of the movies were randomly selected to be coded by both coders. Coders agreed 99.6% of the time regarding whether a major character was a tobacco user. We also assessed smoking among minor characters, a less restrictive category, and among billed major characters (those actors included in the opening credits or on the DVD package), a more restrictive category. Smoking prevalence was 18.4% among the 5944 major characters. Restricting the sample to billed major characters decreased the character sample to 3330, of which 20.5% were smokers. The inclusion of minor characters increased the number of characters to 17 780, of whom 10.6% were smokers.

Sample description

The president of the MPAA appoints a rating board, which rates films that are distributed in the US, based mostly on levels of sexuality, violence and profanity. Movies are rated into the following categories: G, general audiences, all ages; PG, parental guidance suggested for children; PG-13, parents strongly cautioned that some material might be inappropriate for children; R, restricted, people aged <17 years require accompanying adult; and NC-17, no one aged <17 years admitted. The top box office hits included movies in four of the five rating categories: 37 (4.1%) were rated G; 148 (16.4%) PG; 363 (40.3%) PG-13; and 352 (39.1%) R. As there were so few G-rated movies released during the time period, we combined G and PG movies into one category for the analyses by MPAA rating.

Smoking prevalence in the US population

We used data published by the Office of Smoking and Health for the percentage of smoking prevalence among US adults.^{17,18} The Centers for Disease Control and Prevention

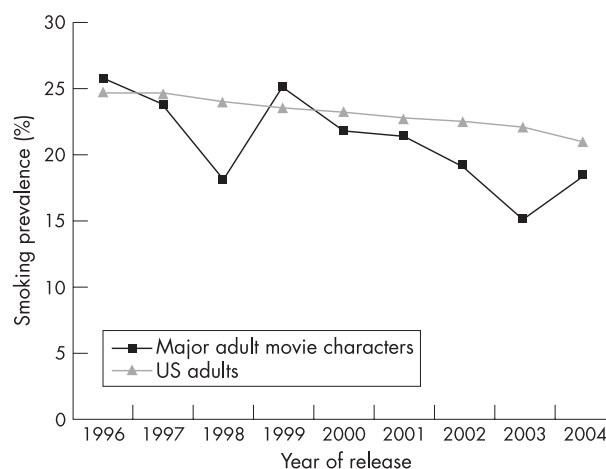


Figure 1 Time trend for smoking prevalence among major adult movie characters ($n=4893$) compared with that in the US adult population.

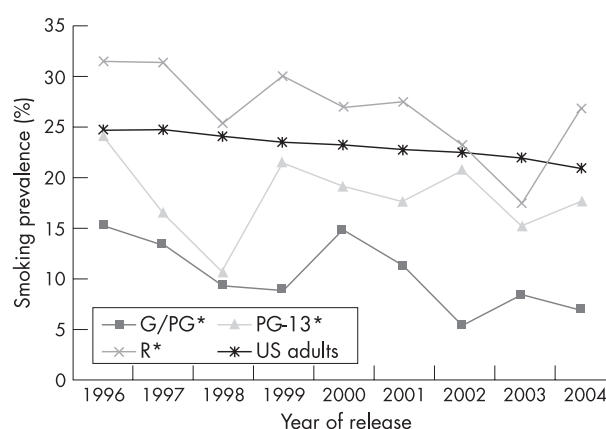


Figure 2 Smoking prevalence for major adult movie characters from movies rated G/PG ($n=711$), PG-13 ($n=2098$) and R ($n=2084$). G, general audiences, all ages; PG, parental guidance suggested for children; PG-13, parents strongly cautioned that some material might be inappropriate for children; R, restricted, people aged <17 years require accompanying adult.

determines smoking status using questions in the US National Health Interview Survey adult core questionnaire. Current smokers were defined as those who reported smoking >100 cigarettes during their lifetimes and who reported that they currently smoked every day or some days. Current smoking for US adults was not determined for 1996; however, the smoking prevalence in 1995 was the same as it was in 1997 (24.7%), so it was assumed that prevalence was

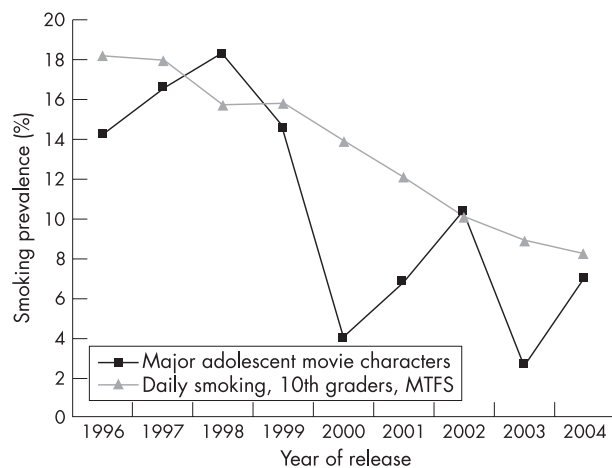


Figure 3 Smoking prevalence for major adolescent movie characters ($n = 466$) compared with daily smoking prevalence among US 10th-graders. MTFS, Monitoring the Future Survey.

also 24.7% in 1996. Smoking among adolescents was determined from the Monitoring the Future Survey (MTFS), which surveys a representative sample of US adolescents in 8th, 10th and 12th grades.¹⁹ The MTFS reports several smoking outcomes. For comparison with smoking among adolescent characters, we used the percentage of 10th-grade adolescents who smoke cigarettes daily. We chose to use 10th-grade students as our comparison group because they are in the middle of the range of adolescent ages available in the MTFS data.

Statistical methods

This report uses the term “smoking prevalence” throughout to refer to the percentage of smoking prevalence (percentage of the population (humans or movie characters) that smoke cigarettes). We evaluated time trends for smoking prevalence among movie characters by year, for adult human and adolescent human characters overall, as well as grouped by MPAA rating category. As movie is the character unit to which adolescents are exposed, we also examined smoking prevalence among adult characters by movie, trending the percentage of movies each year in which smoking prevalence among adult characters was higher than that in the US adult population for the year of release. We used logistic regression analysis to examine the trend over time for this outcome by modelling the odds of releasing a movie that contained smoking prevalence among characters that was higher than in the general population, using 1996 as the reference year. All p values are two sided and the significance level is set at 0.05.

RESULTS

Aggregated smoking prevalence

The movies contained 5944 characters, with a mean (standard deviation (SD)) of 6.6 (2.6) major characters per movie, most (4911) of whom were adult human characters (table 1).

The overall smoking prevalence was 9.9% for adolescent humans, 20.6% for adult humans and 5.5% for other major characters (which included animals, aliens, robots and characters that could not be coded). Among major adult characters, smoking prevalence was associated with sex (22.6% for men and 16.1% for women; $p < 0.001$) and MPAA rating category (26.9% for movies rated R, 17.9% for those rated PG-13 and 10.4% for those rated G/PG; $p < 0.001$). The smoking prevalence among adolescent characters did not

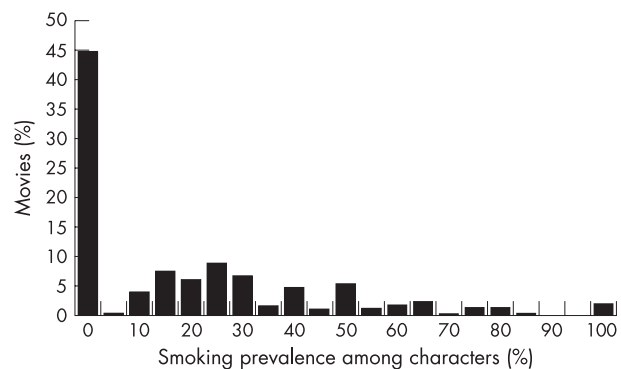


Figure 4 Smoking prevalence among major adult characters in 876 movies with one or more adult characters.

differ by sex, but was associated with movie rating category (18.3% for movies rated R, 11.0% for those rated PG-13 and 1.2% for those rated G/PG, $p < 0.001$).

Smoking prevalence by year

Figure 1 shows the time trend for smoking prevalence among adult human characters and US adults. Over the 9 years, smoking prevalence declined in the US adult population from 24.7% in 1996 to 20.9% in 2004. It also similarly declined among adult movie characters (p for trend < 0.001). Smoking prevalence among adult characters was roughly equivalent (25.7%) to that among US adults in 1996, and by 2004 the prevalences among both adult characters (18.4%) and US adults (20.9%) had fallen to about 20%. Figure 2 shows the time trend in smoking among adult human characters, grouped by MPAA rating category. Although we found significant downward trends in character smoking in movies rated G/PG ($p < 0.019$) and R ($p < 0.003$), the downward trend in movies rated PG-13 was not significant ($p = 0.503$).

Figure 3 shows smoking prevalence among major adolescent movie characters ($n = 466$) compared with data on daily smoking rates among US 10th-graders from the MTFS. In 1996, the smoking prevalence among major adolescent characters (14.3%) was similar to the actual daily smoking prevalence among US 10th-graders (18.3%). There has been a well-publicised decline in daily smoking among US adolescents during this period, with daily smoking for MTFS 10th-graders dropping from 18% in 1996 to 8.3% in 2004. Smoking among adolescent movie characters also declined significantly, from 14.3% in 1996 to 7.0% in 2004 ($p < 0.004$), lower than the smoking prevalence in US

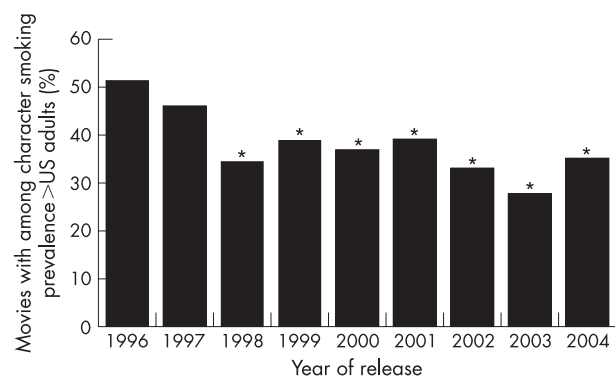


Figure 5 Percentage of movies in which smoking prevalence among adult characters was higher than the actual US smoking prevalence in the general population, by year, for the 876 movies with one or more human adult characters. *Significantly lower than 1996.

10th-graders for that year (8.3%). The number of adolescent characters was too small to conduct trend analysis stratified by MPAA rating categories.

Adult smoking prevalence by movie by year

Figure 4 shows the smoking prevalence among major adult characters, by movie, for the 876 movies with one or more major adult characters. In this sample, 43.3% of movies had no major adult character smoking. However, 39% of movies depicted smoking prevalence among adult characters to be higher than that among the US population in the year of release. As fig 4 shows, smoking prevalence in the movies varied widely, with some movies depicting no smoking, some with a prevalence only slightly higher than that in the population and a few movies depicting all the major adult characters as smokers. In 1996, 52% of movies depicted adult smoking as more prevalent than it was in the US population (fig 5). The percentage of movies each year that depicted smoking at higher rates than it was in the US population in the year of release declined significantly over the observation period (p for downward trend <0.012). In 2004, 36.1% of movies depicted smoking among adults as more prevalent than it really was in the population. After controlling for movie rating and the number of adult characters who starred in the movie, the odds of releasing a film portraying smoking as more prevalent than it was in the population was significantly lower in seven of the eight subsequent years after 1996.

DISCUSSION

This study represents the most extensive analysis of smoking prevalence among movie characters reported to date, covering about 900 releases over a 9-year period. This outcome is important because it reflects the magnitude of the potential exposure to smoking among movie characters, an exposure that has been strongly linked with smoking among adolescents.^{2 4-6 20 21} In addition, higher smoking prevalence among characters could influence adolescents' perception of smoking as a normative behaviour, an attitude that could predict the adoption of smoking.²²⁻²⁶

When aggregated by year of release, smoking prevalence among movie characters declined in adolescents and adults. These results challenge recent reports that smoking in movies has increased¹¹ or remained stable over time¹² and that smoking prevalence in movies is more than that in the general population.²⁷ Using a larger and more comprehensive sample of recent movies than has been used in previous research, we show a significant downward trend in the smoking prevalence among characters, both among adults and adolescents, trends that parallel the downward trends in smoking among US youths and adults over the past 9 years. As we have not reported smoking prevalence among characters in movies released before 1996, we are unable to comment on historical trends in smoking among movie characters.

Smoking prevalence among movie characters from the top box office hits has been similar to that among the general population in the past 20 years.^{9 13} The exposure to smoking in movies is linked with smoking in adolescents.^{2 4} Thus, it is important to point out that despite an occurrence rate not greater than that in the general population, exposure to smoking among movie characters seems to influence the smoking behaviour among adolescents. This could be because smoking in movies bears little resemblance to actual smoking, in part because movie characters are not subject to the usual restrictions on smoking (eg, smokers in movies rarely have to go outside to smoke). In addition, smoking among movie characters is interpreted on two levels: the level of the movie character and the level of the actor. Previous

research has shown that adolescents who have a more favourable image of the typical smoker report more willingness to try smoking,^{28 29} and that those who are more willing are more likely to smoke.²⁹ It is possible that the images of smoking adolescents acquire from the movies contribute to their images of a typical smoker. When characters who smoke, or the actors who play them, have characteristics that adolescents see as positive, this may favourably affect an adolescent's willingness to smoke.

When grouped by movie, smoking among adult characters is depicted as more common than seen in US adults about 39% of the time, and is not present about 43% of the time. Smoking prevalence among characters has not been reported previously at the movie level. We suggest that aggregation by movie is an important way to report smoking among movie characters, because the movie (not the year of release) is the primary character grouping through which the public views smoking in movies. Perception of smoking prevalence in movies will vary among adolescents, depending on the mix and the number of movies any adolescent watches. This is one reason why exposure to smoking in movies varies widely among adolescents,³⁰ and may also be why higher exposure to smoking in movies among never-smokers is associated with a greater likelihood of the perception that adult smoking is normative.³

This study has several limitations. We did not content code a full sample of Hollywood releases each year (Hollywood releases several hundred movies every year). However, by choosing the top 100 movies, we did capture most of the popular movies, those typically seen by adolescents. We are reporting the amount of smoking among characters in these movies and are not speaking about the reach of these movies. It is important to recognise that movies vary in their reach in the adolescent population. A movie with only one or two smoking scenes that is seen by 80% of adolescents may have a greater effect than one with 20 smoking scenes that is seen by only 5% of adolescents. In addition, some movies—and therefore those smoking scenes—are seen many times.

What this paper adds

- Exposure to smoking in movies has been linked to initiation of smoking in adolescents. Therefore, it is important to understand how smoking is depicted in movies and to track how this changes over time. This study emphasised smoking among movie characters, assessing its prevalence in aggregate and over time for a large sample of popular contemporary movies.
- The prevalence of smoking among major adolescent and adult movie characters mirrors its prevalence in the US population; it is declining over time.
- The prevalence of smoking among adult movie characters was roughly equivalent (25.7%) to that among US adults in 1996. By 2004, it was slightly below (18.4%) the US adult smoking prevalence of 20.9%. The downward trend in the prevalence of smoking among adult movie characters is significant only for G/PG-rated and R-rated movies.
- Despite this overall downward trend, 39.1% of movies from 1996 to 2004 depicted smoking among adult characters as more prevalent than that in the US population in the year of release.
- This paper suggests that monitoring smoking prevalence among movie characters over time is an important public health activity.

Another limitation with simply reporting smoking prevalence among characters is that smoking among all characters is not the same. Contextual elements associated with smoking among movie characters (such as the sex, or race or ethnicity of the character) may influence the effect of character smoking on behaviour. More research is needed to further define the contextual elements that make watching a character smoke an inducement to smoke.

CONCLUSION

The trend of smoking prevalence among adolescent and adult movie characters is decreasing. The trend in adults is explained primarily by a statistically significant downward trend for character smoking in movies rated G/PG or R; the downward trend for character smoking in movies rated PG-13 was not statistically significant. Despite smoking prevalence among movie characters being lower than that in the general population, 36% of movies continue to present smoking as more prevalent than seen in real life. Smoking prevalence among movie characters is an objective measure that can be used to monitor the movie industry from a public health perspective.

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